

What is claimed is:

1. A capacitor comprising:

an electrode;

5 an oxygen diffusion barrier layer containing aluminum on
the electrode;

a dielectric layer on the oxygen diffusion barrier layer;
and

a top electrode on the dielectric layer.

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2. The capacitor as recited in claim 1, further
comprising an oxygen diffusing layer containing nitrogen
between the bottom electrode and the oxygen diffusion layer
containing aluminum.

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3. The capacitor as recited in claim 1, wherein the
bottom electrode includes hemi-spherical grains on a surface
thereof.

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4. The capacitor as recited in claim 1, wherein the
oxygen diffusion barrier layer is an alumina layer.

5. A method fabricating a capacitor, comprising the steps
of:

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a) forming an bottom electrode;

b) forming an oxygen diffusion barrier layer containing
aluminum on the bottom electrode;

c) forming a dielectric layer on the oxygen diffusion barrier layer; and

d) forming a top electrode on the dielectric layer.

5 6. The method as recited in claim 5, wherein the step a) includes the steps of:

 a1) forming a hemi-spherical grains on a surface of the bottom electrode; and

 a2) forming an oxygen diffusion layer containing nitrogen
10 on the bottom electrode.

 7. The method as recited in claim 6, wherein the oxygen diffusion barrier layer containing nitrogen is formed by using a rapid thermal process or a plasma nitride process.

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 8. The method as recited in claim 5, wherein the oxygen diffusion barrier is an alumina layer.

 9. The method as recited in claim 8, wherein the alumina
20 layer is formed by using a low pressure chemical vapor deposition technique or an atomic layer deposition technique.

 10. The method as recited in claim 8, wherein the alumina layer is formed at a temperature of about 350 °C to 500 °C.

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